



C.U.SHAH UNIVERSITY – Wadhwan City

FACULTY OF: -Technology and Engineering (Diploma Engineering)

DEPARTMENT OF: - Civil Engineering

SEMESTER: - VI **CODE:** -2TE06ACT1

NAME –Advanced Construction Technology

Teaching & Evaluation Scheme:-

| Subject Code | Subject Name | Teaching Scheme (Hours) | | | | Credits | Evaluation Scheme | | | | | | | | |
|--------------|----------------------------------|-------------------------|----|----|-------|---------|-------------------|-------|-----------------|-------|-------------------|----|------------|----|-------|
| | | Th | Tu | Pr | Total | | Theory | | | | Practical (Marks) | | | | Total |
| | | | | | | | Sessional Exam | | University Exam | | Internal | | University | | |
| | | | | | | | Marks | Hours | Marks | Hours | Pr | TW | Pr | Tw | |
| 2TE06ACT1 | Advanced Construction Technology | 04 | 02 | 00 | 06 | 05 | 30 | 1.5 | 70 | 03 | --- | 20 | 30 | -- | 150 |

Objectives: - The student should be able to Understand the new technologies used in construction field. Understand the use of different types of tools, plants and equipment used in Construction industry. Understand the effective layouts of equipment significance of time scheduling and Resource balancing. Understand the phenomenon of earthquake engineering, its effects & design Considerations etc. Understand the special methods of maintenance, pre maintenance, suitable measures etc. Develop the ability to prepare reports, seminars etc.

Prerequisites: - Basic knowledge of dams and Earthquake engineering.

Course Outlines:-

| Sr. No. | Course Contents | Teaching Hours |
|---------|--|----------------|
| 1 | INTRODUCTION and MODERN MATERIALS OF CONSTRUCTION Understand the scope of learning the course Advanced Construction Technology. State the advanced types of civil Engineering structures Multistoried building, Chimney, Elevated reservoir, Dams and retaining walls, Bridges and Hydraulic structures. Industrial structures, Marine and offshore structures. Tall structures, Introduction of the effect of lateral forces on buildings. Wind, Water, Earthquake | 10 |
| 2 | PLANTS AND EQUIPMENT USED IN CONSTRUCTION Earthmoving machineries. Handling equipment, Hoisting equipment, Conveying equipment, Pumping equipment, Compacting equipment, Equipment for excavation, Power shovel, Dragline, Clamshell, Scoop, Trenching machine, Wheel mounted belt loaders. Earthmoving equipment, Tractors, Bulldozers, Graders, Scrapers, Rippers, Hauling equipment, Trucks, Wagon, Dumpers, Cable ways, Aerial Tramways, Hoisting equipment, Derrick – Pole, Gin – Pole, Crane, Power driven scotch derrick crane, Hand operated crane, Locomotive crane, Gantry crane, Tower crane, Shear leg, Lattice Girder, Winches, Blocks/Jacks, Elevators. Ladder. | 10 |
| 3 | COFFER DAMS: - The necessity of cofferdam, Define cofferdam, Sketch types of cofferdam, Explain with suitable sketches types of cofferdam like. Earthen cofferdam, Rock fill cofferdam, Cellular cofferdam, Single walled cofferdam, Double walled cofferdam, Discuss utility of above cofferdams in different situations, Force acting on cofferdam, List forces considered in the design of cofferdams like: Water pressure, Self-weight, Silt pressure, Uplift pressure. Seepage of water below cofferdam, Discuss the economic height of cofferdam, Explain in your own words concept of satisfactory height with | 10 |

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| | Respect to normal flood level. | |
| 4 | DEEP AND SHALLOW EXCAVATION Shallow and deep excavation, Define shallow excavation. Define Deep excavation. Give Examples. Differentiate shallow and deep excavations. Predict problems likely to occur in excavation, Explain necessity of timbering in trenches. Label the component parts of timbering on a sketch. State the precautions to be taken during timbering. Significances of dewatering, Define dewatering, State the reasons for dewatering, Give the conditions to the students for deciding the Requirements for dewatering. | 5 |
| 5 | DRILLING AND BLASTING Define drilling operation, Explain necessity of drilling for the purpose of blasting & other uses in hard rock or in earth. Terminology used for drilling. Factors affecting the selection of drilling method & equipment. Types of drilling – Inclined, Horizontal & Vertical. Heading – Full/ partial face heading and banding. Necessity of selecting the drilling pattern for blasting, Explain how the size of the hole depends upon. The type and size of drill used, Depth of hole, Type of rock, Maximum size of rock required. Discuss the economy of drilling hole, Factors helping in analyzing the drilling operations, Quantity required m of length, Explain in kg / m ³ of rock, Explain in kg/m of hole | 5 |
| 6 | EARTHQUAKE ENGINEERING General Principles of Planning of building relates to Earthquake. Points affecting the selection of materials. Design consideration for buildings. General construction consideration. Framed structures. Geometrical layout - Shape and orientation of buildings. Distribution of loads. Wall panels. Opening in walls. Requirements for wall beams etc. Unframed building. Minimum thickness of walls. Reinforcing bends. Height of walls. Opening in walls. Partition walls. Load Bearing walls. Miscellaneous, Foundation for Earthquake structures, Anchoring of buildings and massive structures | 5 |

Term Work:- Sketch at least five transporting equipment and prepare salient features of it.

-Sketch at least three excavating equipment and prepare salient features of it. Sketch any three compacting equipment (d) Sketch any three hoisting Equipment & label it.

- Timbering for different situations / types of soil & depth.

- Dewatering methods for different cases.

-Well point system.

- Electro-osmosis.

Learning Outcomes:

Advanced Construction Technology is an essential course to all civil engineering students. The civil engineering technicians should know the advanced methods and technologies of construction, plants and equipment used in construction etc. Lateral forces-their effects resistive systems are covered in this course with special maintenance techniques.

Books Recommended:-

1. Construction, planning equipment & methods. ROBERT L. PEURIFOY WILLIAM B. LEDBETTER
2. Building Construction SUSHIL KUMAR
3. Learning from failures R.N. RAIKAR
4. Durable structure through planning for preventive measures R.N. RAIKAR
5. Diagnosis and Treatment structure in Distress R.N. RAIKAR
6. Building structures JAMES ABROSE.
7. Standard handbook of civil engg. Gurcharansingh
8. Building construction S.C. Rangwala
9. Civil Engineering Practice (I,II,III) Kaushik, Asawa & Ahuja
10. Services in Building Complex V.K.Jain
11. Civil Engineering Construction Antill & Ryan
12. Pile Foundations Tomlinson
13. Dharatikamp & Navnirman Manviya Technology Forum (In Gujarati) Earthquake special.